



## CURRICULUM VITAE

**Name**

David J. FitzGerald

**Current Position**

Chief, Biotherapy Section  
Laboratory of Molecular Biology  
Division of Basic Science  
National Cancer Institute, NIH

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**Education**

Trinity College, Dublin, Ireland  
U of Cincinnati, Col of Med, OH

BA Mod 1977  
PhD 1982

Microbiology  
Microbiology

**Employment**

1982 - 1984  
1985 - 1987  
1987 - 1994  
1994-present

Staff Fellow, LMB, DCBDC, NCI, NIH  
Senior Staff Fellow, LMB, DCBDC, NCI, NIH  
Microbiologist, LMB, DCBDC, NCI, NIH  
Chief, Biotherapy Section, LMB, DBS, NCI, NIH

**Honors**

January 1980  
June 1991  
June 1992

Awarded the Albert J. Ryan Fellowship.  
NIH Director's Award  
Pierce Immunotoxin Award, at The Third International  
Immunotoxin Meeting, Orlando, FL.

July 1994

Chair, Gordon Conference, *Drug Carriers in Medicine &*

*Biology.*

September 1995  
February 1999

NIH Award of Merit  
Awarded NCI Intramural Research Award (IRA)

**Teaching Experience**

Was invited to teach a two-week (September - October, 1988) course on immunotoxins at the Shanghai Institute of Biochemistry (joint U.S. National Academy of Science and Chinese

Academy of Science program).

**Editorial Boards**

*Infection and Immunity* (1987-1989)  
*Journal of National Cancer Institute* (1990-1994)  
*Journal of Pharmaceutical Sciences*  
*Journal of Bioconjugate Chemistry* (1990-1994)  
*Journal of Drug Targeting*  
*Therapeutic Immunity*  
*Journal of Biological Chemistry* (1996- )

**Peer Review Experience**

Member of Study Section for Tropical  
 Medicine and Parasitology, October 1986  
 Member of special study section to review  
 toxin-based grant proposals, July 1988  
 American Cancer Society, Ad Hoc Reviewer for  
 Immunotherapy Study Section, Spring 1991

**Clinical Investigation**

Co-investigator on FDA-approved protocol  
 with PE-ANTI-TAC to treat patients with adult- T-cell leukemia,  
 IND #BB IND 2174 (NSC 600665).  
 Co-investigator on FDA-approved protocol  
 with OVB3-PE to treat patients with ovarian cancer,  
 IND #IND2688 (NSC 615048).  
 Co-investigator on FDA-approved protocol  
 with LMB-1 to treat patients with adenocarcinomas  
 IND #5017 (NSC 651311).  
 Co-investigator on Phase I application for IND of  
 immunotoxin directed to CD22+ leukemias and  
 lymphomas (IND/NSC numbers not yet available).

**Committee Experience**

An original member and presently serving on NCI's  
 "Technology Review Group". Responsible for reviewing all new  
 invention reports and making strategic decisions about  
 how to prosecute NCI's existing patent portfolio.

**Societies**

AAAS  
 American Society for Biochemistry and  
 Molecular Biology

**Patents**

Pastan, I., Willingham, M.C., and FitzGerald, D.J.: *Pseudomonas*  
 exotoxin conjugate immunotoxins. (Assignee: U.S.A., D.H.H.S.) (Filed January 26, 1984.) Granted U.S.  
 Patent #4,545,985, October 8, 1985.  
 Pastan, I., FitzGerald, D.J.P., and Willingham, M.C.:  
 Monoclonal antibody against ovarian cancer cells (OVB3). Patent  
 #4,806,494, February 21, 1989.  
 Pastan, I., Adhya, S., and FitzGerald, D.J.P.: Recombinant  
*Pseudomonas* exotoxin: Construction of an active immunotoxin with low  
 side effects. Patent #4,892,827, January 9, 1990.  
 Bjorn, M.J., FitzGerald, D.J., Frankel, A.E., Laird, W.J., Pastan,

I.H., Ring, D.B., Willingham, M. C., and Windelhake, J. L.:  
Anti-human ovarian cancer immunotoxins and methods of use thereof.  
(Assignee: Cetus Corporation) (Filed July 6, 1987.)  
Granted U.S. Patent #4,958,009, September 18, 1990.

Pastan, I., FitzGerald, D., and Ogata, M.: Selectively cytotoxic IL-4-PE40  
D.H.H.S.) (Filed May 12, 1989.) Granted U.S. Patent #5,082,927,  
fusion protein. (Assignee: U.S.A.,  
January 21, 1992.

Berger, E.A., Fuerst, T.R., Pastan, I., FitzGerald, D., Mizukami, T., and  
Chaudhary, V.K.: CD-4/cytotoxic gene  
fusions. Patent #5,206,353, (Assignee: U.S.A., D.H.H.S.)  
(Filed July 22, 1988.) Granted U.S. Patent #5,206,353,  
April 27, 1993.

Pastan, I.H., Trevor, P., FitzGerald, D.J., Debinski, W., and Siegall, C.:  
Recombinant chimeric proteins deliverable across cellular membranes into cytosol of target cells. (Assignee:  
U.S.A., D.H.H.S.) (Filed March 4, 1991.) Granted U.S. Patent  
#5,328,984, July 12, 1994.

Berger, E.A., Moss, B., Fuerst, T.R., Pastan, I., FitzGerald, D.,  
Mizukami, T., and Chaudhary, V.K.: Cytotoxic agent against specific  
virus infection. (Assignee: U.S.A.) (Filed February 25, 1993.) Granted U.S. Patent #5,428,143, June 27, 1995.

Pastan, I., Chaudhary, V.K., and FitzGerald, D.: P. exotoxin  
fusion proteins have COOH-terminal alterations which  
increase cytotoxicity. (Assignee: U.S.A., D.H.H.S.) (Filed  
May 14, 1990.) Granted U.S. Patent #5,458,878, October 17,  
1995.

Pastan, I., FitzGerald, D., and Chaudhary, V.K.: Pseudomonas exotoxins  
(PE) and conjugates thereof having lower animal toxicity with high cytotoxic activity through substitution of positively  
charged amino acids. (Assignee: U.S.A., D.H.H.S.) (Filed October 1, 1993.) Granted U.S. Patent #5,512,658,  
April 30, 1996.

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Rockville, MD 20850

## BIBLIOGRAPHY

1. FitzGerald, D.J.P., Morris, R.E., and Saelinger, C.B.: Receptor-mediated internalization of *Pseudomonas* toxin by mouse fibroblasts. *Cell* 21: 867-873, 1980.
2. FitzGerald, D.J.P., Morris, R.E., and Saelinger, C.B.: The essential role of calcium in cellular internalization of *Pseudomonas* toxin. *Infect. Immun.* 35: 715-720, 1982.
3. FitzGerald, D.J.P., Padmanabhan, R., Pastan, I., and Willingham, M.C.: Adenovirus-induced release of epidermal growth factor and *Pseudomonas* toxin into the cytosol of KB cells during receptor-mediated endocytosis. *Cell* 32: 607-617, 1983.
4. FitzGerald, D.J.P., Trowbridge, I.S., Pastan, I., and Willingham, M.C.: Enhancement of toxicity of antitransferrin receptor antibody *Pseudomonas* exotoxin conjugates by adenovirus. *Proc. Natl. Acad. Sci. USA* 80: 4134-4138, 1983.
5. Willingham, M.C., Haigler, H.T., FitzGerald, D.J.P., Gallo, M.G., Rutherford, A.V., and Pastan, I.: The morphologic pathway of binding and internalization of epidermal growth factor in cultured cells. *Exp. Cell Res.* 146: 163-175, 1983.
6. Zoon, K.C., Arnheiter, H., Zur Nedden, D., FitzGerald, D.J.P., and Willingham, M.C.: Human interferon alpha enters cells by receptor-mediated endocytosis. *Virology* 130: 195-203, 1983.
7. FitzGerald, D.J.P., Morris, R.E., and Saelinger, C.B.: Inhibition of *Pseudomonas* toxin internalization by methylamine. *Rev. Infec. Dis.* 5: Suppl. S985-991, 1983.
8. FitzGerald, D.J.P., Waldmann, T.A., Pastan, I., and Willingham, M.C.: PE-anti-Tac: a cell-specific immunotoxin active against cells expressing the human T-cell growth factor receptor. *J. Clin. Invest.* 74: 966-971, 1984.
9. Seth, P., FitzGerald, D.J.P., Willingham, M.C., and Pastan, I.: Role of a low pH environment in adenovirus enhancement of the toxicity of a *Pseudomonas* exotoxin epidermal growth factor conjugate. *J. Virol.* 51: 650-655, 1984.
10. Akiyama, S., Gottesman, M.M., Hanover, J.A., FitzGerald, D.J.P., Willingham, M.C., and Pastan, I.: Verapamil enhances the toxicity of an epidermal growth factor *Pseudomonas* exotoxin conjugate. *J. Cell Physiol.* 120: 271-279, 1984.
11. Seth, P., FitzGerald, D., Ginsberg, H., Willingham, M., and Pastan, I.: Evidence that the penton base of adenovirus is involved in potentiation of *Pseudomonas* exotoxin conjugated to epidermal growth factor. *Mol. Cell. Biol.* 4: 1528-1533, 1984.
12. Akiyama, S., Seth, P., Pirker, R., FitzGerald, D., Gottesman, M.M., and Pastan, I.: Potentiation of cytotoxic activity of immunotoxins on cultured human cells. *Cancer Res.* 45: 1005-1007, 1985.
13. Pirker, R., FitzGerald, D.J., Hamilton, T.C., Ozols, R.F., Willingham, M.C., and Pastan, I.: Anti-transferrin receptor antibody linked to *Pseudomonas* exotoxin as a model immunotoxin in human ovarian carcinoma cell lines. *Cancer Res.* 45: 751-757, 1985.
14. FitzGerald, D.J.P.: Transport of adenovirus and toxin conjugates into cells via the common pathway of receptor-mediated endocytosis. *Microbiology* 85-90, 1985.

15. Pirker, R., FitzGerald, D.J., Hamilton, T.C., Ozols, R.F., Laird, W., Frankel, A.E., Willingham, M.C., and Pastan, I.: Characterization of immunotoxins active against ovarian cancer cell lines. *J. Clin. Invest.* 76: 1261-1267, 1985.
16. Zoon, K.C., Arnheiter, H., Zur Nedden, D., FitzGerald, D.J., and Willingham, M.C.: Procedures for measuring receptor-mediated binding and internalization of human interferon. In *Methods of Enzymology* 119: 332-339, 1986.
17. Pastan, I., Seth, P., FitzGerald, D., and Willingham, M.C.: Adenovirus entry into cells: Some new observations on an old problem. In Notkins, A.L. and Oldstone, M.B.A. (Eds.): *Concepts in Viral Pathogenesis*, Vol. II. New York, Springer Verlag, 1986, pp. 141-146.
18. FitzGerald, D.J., Willingham, M.C., and Pastan, I.: Anti-tumor effects of an immunotoxin made with *Pseudomonas* exotoxin in a nude mouse model of human ovarian cancer. *Proc. Natl. Acad. Sci. USA* 83: 6627-6630, 1986.
19. Pastan, I., Willingham, M.C., and FitzGerald, D.J.P.: Immunotoxins. *Cell* 47: 641-648, 1986.
20. Seth, P., FitzGerald, D., Willingham, M.C., and Pastan, I.: Pathway of adenovirus entry into cells. In Crowell, R. and Lonberg-Holm, K. (Eds.): *Virus Attachment and Entry Into Cells*. Washington, D.C., American Society for Microbiology, 1986, pp. 191-195.
21. Hwang, J., FitzGerald, D.J.P., Adhya, S., and Pastan, I.: Functional domains of *Pseudomonas* exotoxin identified by deletion analysis of the gene expressed in *E. coli*. *Cell* 48: 129-136, 1987.
22. FitzGerald, D.J.P., Bjorn, M.J., Ferris, R.J., Winkelhake, J.L., Frankel, A.E., Hamilton, T.C., Ozols, R.F., Willingham, M.C., and Pastan, I.: Antitumor activity of an immunotoxin in a nude mouse model of human ovarian cancer. *Cancer Res.* 47: 1407-1410, 1987.
23. Willingham, M.C., FitzGerald, D.J., and Pastan, I.: *Pseudomonas* exotoxin coupled to a monoclonal antibody against ovarian cancer inhibits the growth of human ovarian cancer cells in a mouse model. *Proc. Natl. Acad. Sci. USA* 84: 2474-2478, 1987.
24. FitzGerald, D.J., Willingham, M.C., Cardarelli, C.O., Hamada, H., Tsuruo, T., Gottesman, M.M., and Pastan, I.: A monoclonal antibody *Pseudomonas* toxin conjugate that specifically kills multidrug-resistant cells. *Proc. Natl. Acad. Sci. USA* 84: 4288-4292, 1987.
25. Lyall, R.M., Hwang, J., Cardarelli, C., FitzGerald, D., Akiyama, S.-I., Gottesman, M.M., and Pastan, I.: Isolation of human KB cell lines resistant to epidermal growth factor *Pseudomonas* exotoxin conjugates. *Cancer Res.* 47: 2961-2966, 1987.
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27. Cryz, S.J., Jr., Furer, E., Sadoff, J.C., Germanier, R., Pastan, I., Willingham, M.C., and FitzGerald, D.J.P.: The use of *Pseudomonas aeruginosa* toxin A in the construction of conjugate vaccines and immunotoxins. *Rev. Infect. Dis.* 9: S644-749, 1987.
28. Pirker, R., FitzGerald, D., Willingham, M.C., and Pastan, I.: Immunotoxins and endocytosis. *Lymphokines* 14: 361-382, 1987.
29. FitzGerald, D.J.P.: Construction of immunotoxins using *Pseudomonas* exotoxin A. *Methods Enzymol.* 151: 139-145, 1987.

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37. Chaudhary, V.K., Mizukami, T., Fuerst, T.R., FitzGerald, D.J., Moss, B., Pastan, I., and Berger, E.A.: Selective killing of HIV-infected cells by recombinant human CD4-*Pseudomonas* exotoxin hybrid protein. *Nature* 335: 369-372, 1988.
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- immunodeficiency virus. In Groopman, J.E., Chen, I., Essex, M., and Weiss, R. (Eds.): *Human Retroviruses, UCLA Symposia on Molecular and Cellular Biology, New Series*, Vol 119. New York, Alan R. Liss, Inc., 1989, pp. 261-270.
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74. Batra, J.K., FitzGerald, D., Gately, M., Chaudhary, V.K., and Pastan, I.: Anti- Tac(Fv)-PE40: A single chain antibody *pseudomonas* fusion protein directed at interleukin 2 receptor bearing cells. *J. Biol. Chem.* 265: 15195-15202, 1990.
75. Ashorn, P., Moss, B., Weinstein, J.N., Chaudhary, V.K., FitzGerald, D.J., Pastan, I., and Berger, E.A.: Elimination of infectious HIV from human T-cell cultures by synergistic action of CD4-*pseudomonas* exotoxin and reverse transcriptase inhibitors. *Proc. Natl. Acad. Sci. USA* 87: 8889-8893, 1990.
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